Description

G-ROTOR PUMP

The invention relates to a positive-displacement pump, designed as a G-rotor pump, for the conveyance of fuel in a motor vehicle, with a driven G-rotor arranged between a bottom and a cover of a pump casing and with a spacer arranged between the bottom and the cover.

Such G-rotor pumps are mostly combined with an electric motor to form a conveying unit and are known from practice. The known G-rotor pump has an inlet duct in the cover and an outlet duct in the bottom facing the electric motor. The flow thereby passes axially through the G-rotor pump. The spacer has an essentially annular configuration, so as to surround the G-rotor, and holds the cover at an intended distance from the bottom. The bottom and the cover can consequently be braced relative to one another. The cover, G-rotor, bottom and spacer are manufactured from ceramic with a particularly high surface quality. The high surface quality ensures that an overflow of the conveyed fuel from the region of the outlet to the region of the inlet is avoided.

The known G-rotor pump has the disadvantage that the pump casing has a highly complicated configuration and consequently possesses components which are cost-intensive to manufacture.

The problem on which the invention is based is to design a G-rotor pump of the type initially mentioned in such a way that it can be manufactured particularly cost-effectively.

This problem is solved, according to the invention, in that the bottom and/or the cover are/is manufactured from plastic.

By virtue of this design, the pump casing can be composed of components which are particularly cost-effective to manufacture. The G-rotor pump according to the invention can thereby be manufactured particularly cost-effectively. A further advantage of the G-rotor pump according to the invention is that noises of the G-rotor are damped to a particularly great extent by the components of the pump casing which are manufactured from plastic.

The high surface quality required for reliable operation of the G-rotor pump according to the invention could be achieved, for example, by means of a coating of the bottom and/or of the cover. However, a contribution to further reducing the manufacturing costs of the G-rotor pump according to the invention is made when the bottom and/or the cover are/is lapped on their side located opposite the G-rotor.

A contribution to simplifying the assembly of the G-rotor pump according to the invention is made when the spacer is manufactured in one piece with the cover arranged on that side of the G-rotor which faces away from an electric drive. The bottom arranged on that side of the G-rotor which faces an electric drive can thereby have a planar configuration. This contributes to the further reduction in the manufacturing costs of the G-rotor pump according to the invention.

The invention permits numerous embodiments. To make its basic principle even clearer, one of these is illustrated in the drawing and is described below. The latter shows, in a single figure, a longitudinal section through a fuel conveying unit 1 having a G-rotor pump 2 according to the invention.

The fuel conveying unit 1 has a housing 3 for receiving an electric motor 4 and the G-rotor pump 2. The G-rotor pump 2 has a bottom 5 and a cover 7 held at an intended distance from the bottom 5 via a spacer 6. The spacer 6 and the cover 7 are manufactured in one piece here. A G-rotor 9 fastened on a shaft 8 of the electric motor 4 is arranged between the cover 7 and the bottom 5. The shaft 8 has a flattening 10 for the rotationally fixed take-up of the G-rotor 9. Moreover, the shaft 8 has a shoulder 11 in the region of the G-rotor 9. The G-rotor 9 can thereby be connected to the shaft 8 in the depicted position only. The cover 7 has an inlet 12 and the bottom 5 an outlet 13 of the G-rotor pump 2. Fuel is thereby sucked in via the cover 7 and flows axially through the G-rotor pump 2. The housing 3 of the fuel conveying unit 1 has a connection piece 14 for connecting a line, not illustrated. The flows of the fuel are identified by arrows in the drawing for clarity.

The cover 7 and the bottom 5 are manufactured from plastic and are lapped on their side facing the G-rotor 9. As a result, the cover 7 and the bottom 5 have a particularly high surface quality and can reliably absorb noises.

Furthermore, the G-rotor pump 2 has two screws 15 which prestress the cover 7 against the bottom 5. In an alternative embodiment, not illustrated, the cover 7 is prestressed against the bottom 5 via the housing 3 of the fuel conveying unit. The use of the screws 15 can consequently be dispensed with.